Wyckoff Eagle Harbor Site

EPA United States Environmental Protection Agency

DEPARTMENT OF ECOLOGY State of Washington

Community Interest Group Meeting

May 6, 2014

Meeting Agenda

Status Update on Site Management
- Discussion and informal input from CIG members

Coordination between Upland and Offshore
- EPA presentation
- Discussion and informal input from CIG members

Status of Alternatives Evaluation

Questions and informal input from audience members

Next Steps, Upcoming Meetings
- Community Interest Group Meeting #4 (Sept 10, 2014)
- EPA informal public meeting #2 (anticipated August 2014

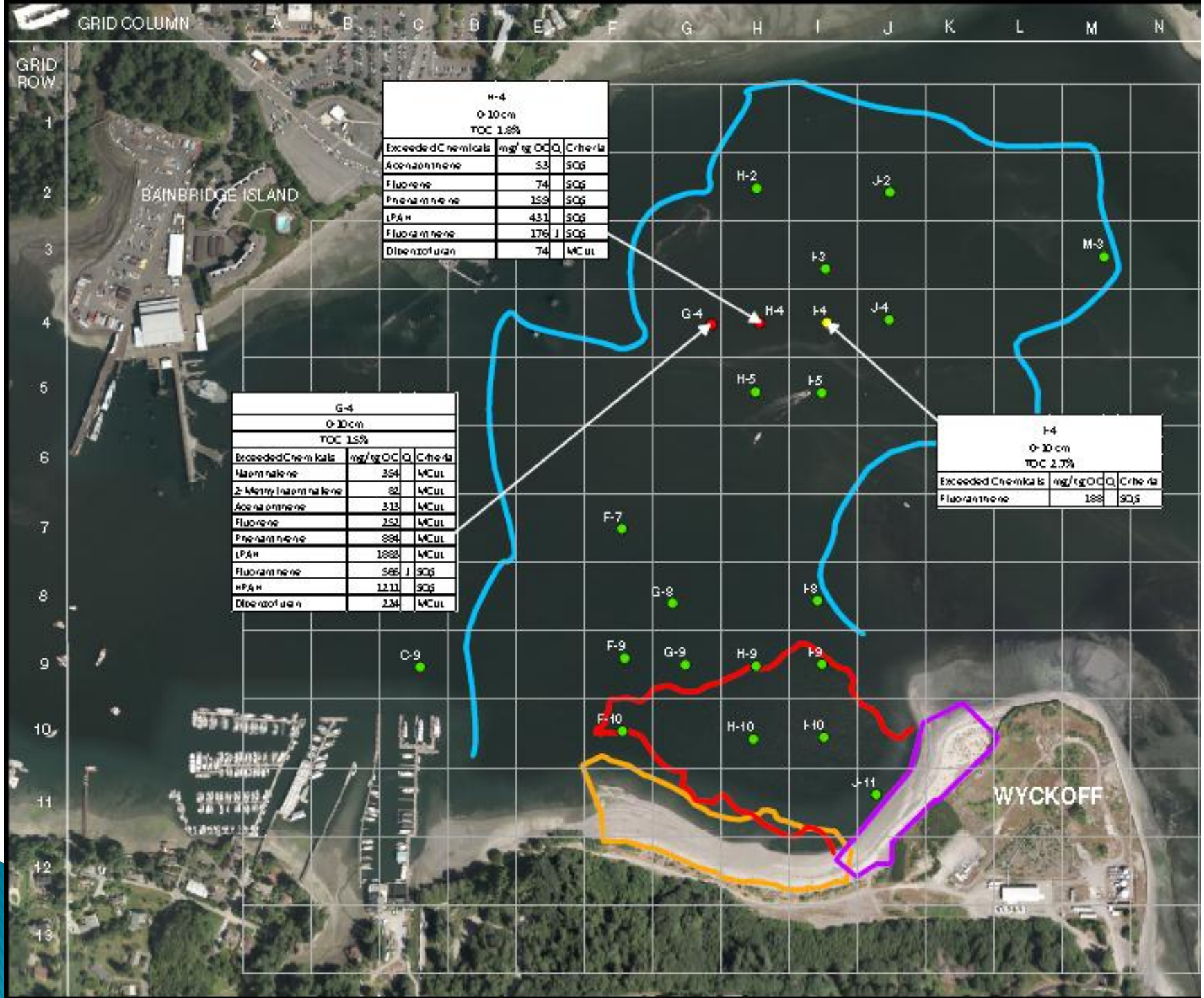
Coordination of Upland and In-Water Activities

- Cleanup planning for OU1 Focused Feasibility Study Area concurrent with upland process
- Upland and offshore areas separate but coordinated
  - Complimentary Remedial Action Objectives
  - Construction sequencing / timing
- Proposed plan, when released for public comment, will cover both areas

OU1 Focused Feasibility Study Area

Why just these areas?

- North Shoal and East Beach have never been cleaned up
- Other offshore areas already capped:
  - Phase I – 54 acres, 1993/94
  - Phase II – 14 acres, 2001
  - West Beach Exposure Barrier System and subtidal cap extension – 2008
- EPA continuing to monitor the performance of these caps, maintenance planned for 2015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BAINBRIDGE ISLAND
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0-10 cm
TOC 1.8%
Exceeded Chemicals | mg/kg OC | Q | Criteria
Acenaphthene | 53 | | SQS
Fluorene | 74 | | SQS
Phenanthrene | 159 | | SQS
LPAH | 431 | | SQS
Fluoranthene | 176 | J | SQS
Dibenzofuran | 74 | | MCUL
G-4
0-10 cm
TOC 1.5%
Exceeded Chemicals | mg/kg OC | Q | Criteria
Naphthalene | 354 | | MCUL
2-Methylnaphthalene | 82 | | MCUL
Acenaphthene | 313 | | MCUL
Fluorene | 252 | | MCUL
Phenanthrene | 884 | | MCUL
LPAH | 1888 | | MCUL
Fluoranthene | 586 | J | SQS
HPAH | 1211 | | SQS
Dibenzofuran | 234 | | MCUL
I-4
0-10 cm
TOC 2.7%
Exceeded Chemicals | mg/kg OC | Q | Criteria
Fluoranthene | 188 | | SQS
H-2
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OU1 FFS Process to Date

- TarGOST investigation of beaches 2012
- * Field Data report 2013
- * Revised Conceptual Site Model 2013
- Screening of remedial technologies 2013
- Development of RAOs 2014

* Available on EPA web site

In the meantime …

Status of Upland Cleanup Alternatives Analysis

Performance Objectives
to be taken into consideration by
Cleanup Alternative Analysis

1. Remove or treat mobile creosote in the upper aquifer to the maximum extent practicable such that migration and leaching of contaminants is significantly reduced.
2. Carry out a cleanup action that does not require long-term active hydraulic control as a part of O&M following implementation of source removal.

Development of Cleanup Alternatives

- Technologies have been combined into sets of cleanup alternatives. Containment alternative is also be considered.
- Alternatives to be considered will be protective of human health and the environment and will meet regulatory standards.
- Alternatives will be evaluated for their ability to reduce toxicity, mobility, or volume; effectiveness (short term & long term); implementability and cost.
- Implementability includes evaluation of duration, noise, odor, traffic, etc.

Superfund 9 Criteria for Evaluation of Cleanup Alternatives

- Threshold Criteria
  - 1. Protection of human health and the environment
  - 2. Ability to meet applicable or relevant and appropriate requirements (e.g. regulations such as MTCA)
- In order for an alternative to be carried forward to the detailed analysis, the alternative must meet the threshold criteria.

Superfund 9 Criteria for Evaluation of Cleanup Alternatives

- Primary Balancing Criteria
  - 3. Long-term effectiveness and permanence
  - 4. Reduction of toxicity , mobility or volume through treatment
  - 5. Short-term effectiveness
  - 6. Implementability
  - 7. Cost

- The focused feasibility study evaluates the cleanup alternatives against these criteria.
- Ability of each cleanup alternative to meet the performance objectives will be evaluated under criteria 3 and 4.

Superfund 9 Criteria for Evaluation of Cleanup Alternatives

- Modifying criteria
  - 8. State/Support agency acceptance
  - 9. Community acceptance

- These criteria are assessed formality after the public comment period on the Proposed Plan.

Technologies Evaluated

- Thermal Enhanced Extraction
  - Belowground Steam Injection
- Medium Temperature Thermal Desorption (MTTD)
  - Aboveground heating ~ 1000°F
- *In Situ* Soil Stabilization (ISS)
  - Belowground mixing with Portland cement mixture
- *In Situ* Chemical Oxidation (ISCO)
  - Belowground mixing with H_2O_2 or permanganate
- Enhanced Aerobic Degradation (EAB)
  - Belowground injection of air
- Passive Groundwater Treatment

Alternatives Being Evaluated

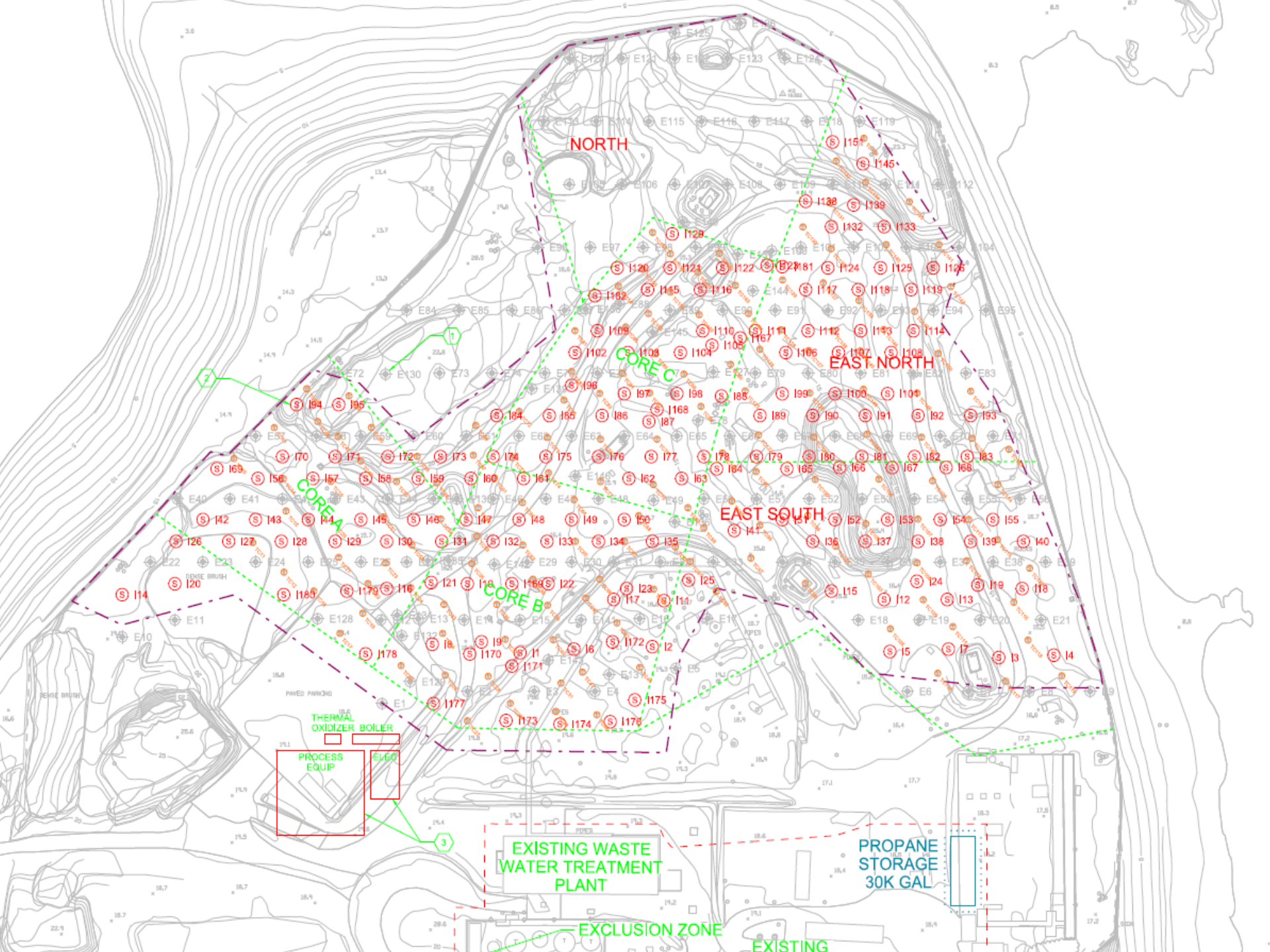
- No action
- Containment
- ISS followed by passive groundwater treatment
- Steam Extraction/Treatment with In-Situ Chemical Oxidation followed by EAB
- Steam Extraction/Treatment with Medium Temperature Thermal Desorption followed by EAB

Common Elements for Most Cleanup Alternatives

- Access Improvements
- Demolition/Decontamination/Disposal/Reuse of existing structures (footings/foundations)
- Propane system/energy evaluation
- Surface cap
- Monitored Natural Attenuation (after active treatment/removal)
- Passive groundwater treatment
- Shoreline enhancements (sheet pile wall)

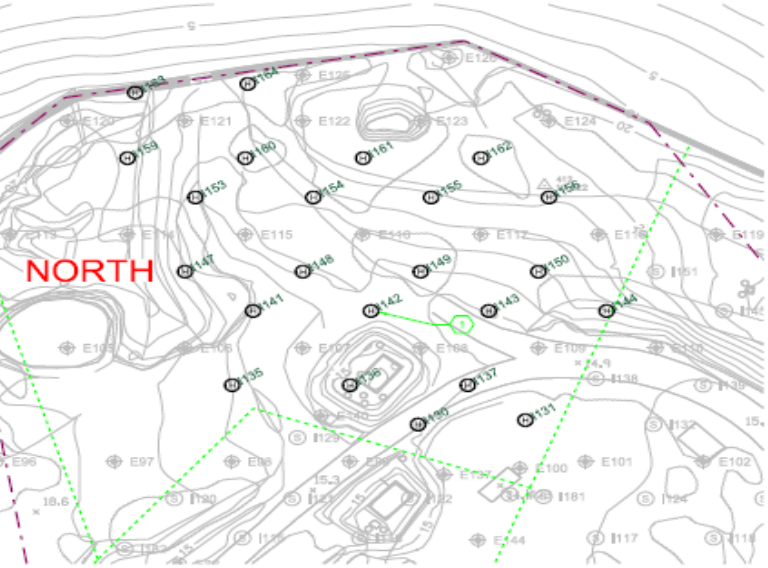
Thermal Enhanced Extraction

- Steam is injected into the subsurface to heat the creosote in order to make it easier to extract.
- Extracted creosote is treated using enhanced/expanded existing groundwater treatment plant.

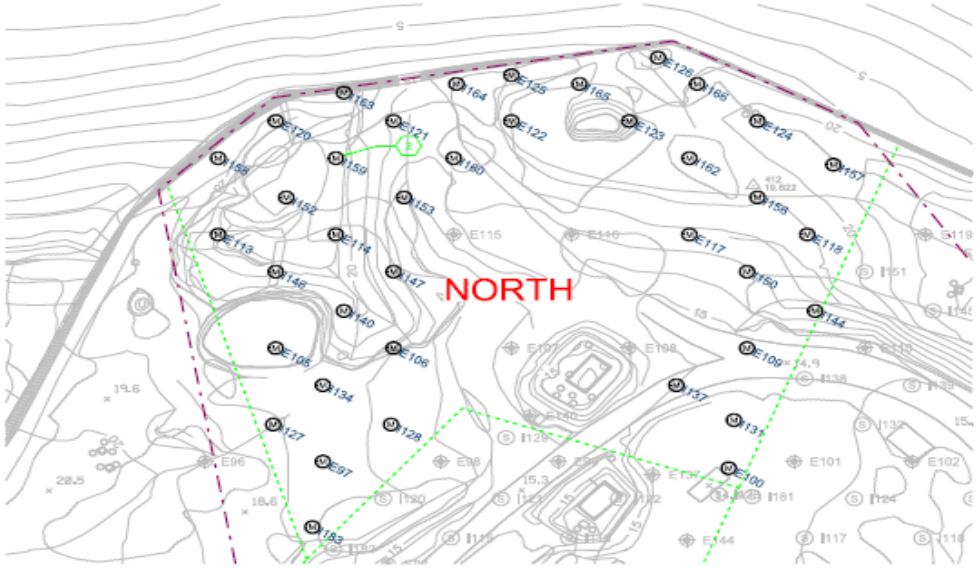

NORTH
EAST NORTH
EAST SOUTH
CORE A
CORE B
CORE C
THERMAL OXIDIZER BOILER
PROCESS EQUIP
ELEC
EXISTING WASTE WATER TREATMENT PLANT
PROPANE STORAGE 30K GAL
EXCLUSION ZONE
EXISTING

In-Situ Chemical Oxidation

- Injection of chemicals ("oxidants") to reduce the toxicity of the creosote compounds.
- Being evaluated as a follow on step to thermal treatment to treat the deeper zones near the wall.
- Chemicals being evaluated include hydrogen peroxide and sodium permanganate.



O – HYDROGEN PEROXIDE INJECTION WELLS



ISCO – PERMANGANATE INJECTION WELLS

CREENED REPRESENTS
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102 FOR DEMOLITION

O PEROXIDE
FOR DETAILS.

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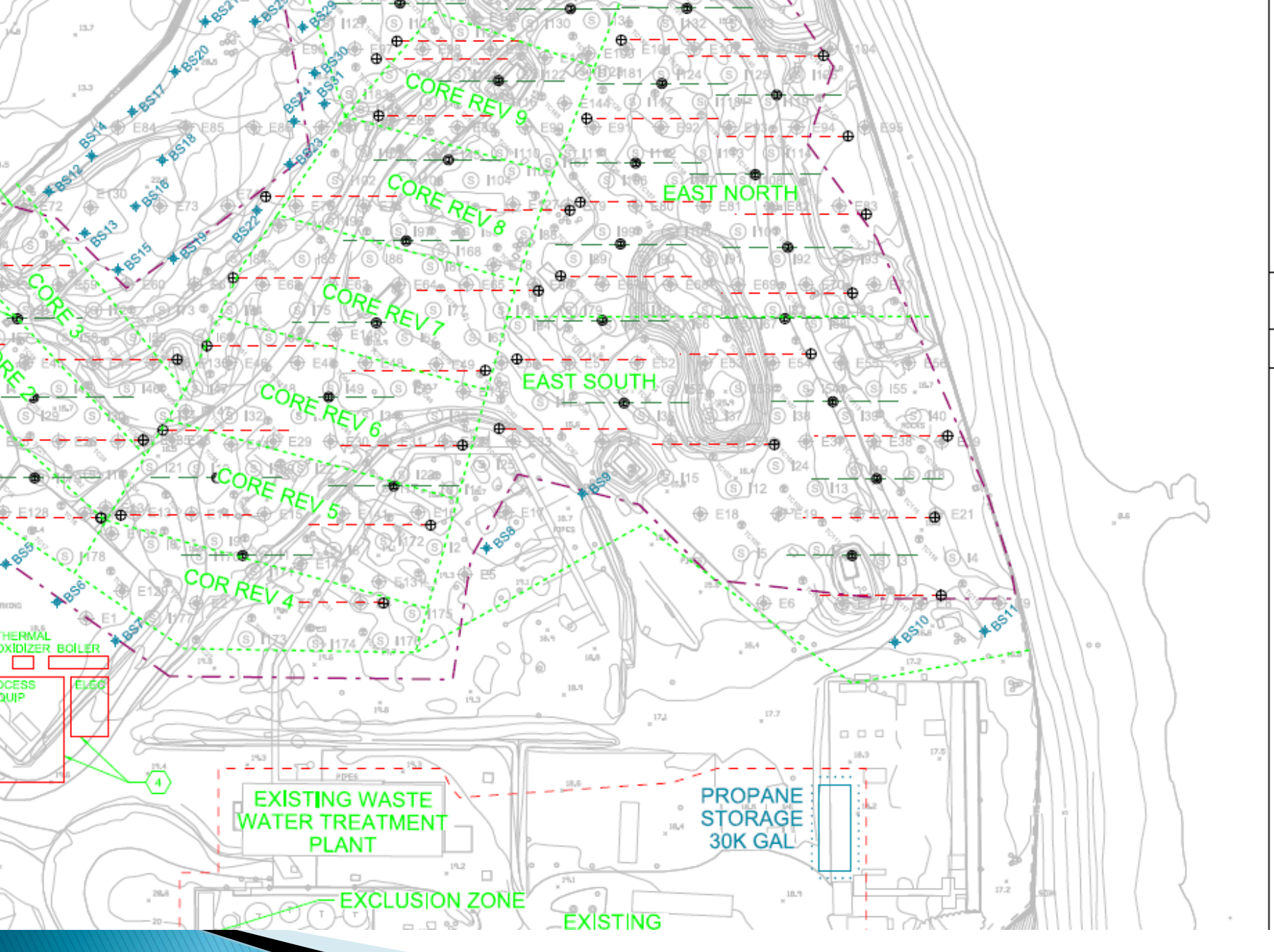
LEGEND

- EXISTING SHEET PILE
- VAPOR COVER LIMITS
- SHEET PILE WALLS
- STEAM INJECTION WELL
- HYDROGEN PEROXIDE WELL
- PERMANGANATE WELL
- EXTRACTION WELL

Enhanced Aerobic Biodegradation

- Follow-on technology to be implemented after thermal remedy is completed in order to take advantage of high subsurface temperatures.
- Injection of air to promote biological growth and breakdown of residual creosote product.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BS30
EXISTING WASTE WATER TREATMENT PLANT
PROPANE STORAGE 30K GAL
EXCLUSION ZONE
EXISTING
THERMAL OXIDIZER BOILER
ELEC
FOCUSED FEASIBILITY STUDY
ALTERNATIVE 6 THERMAL

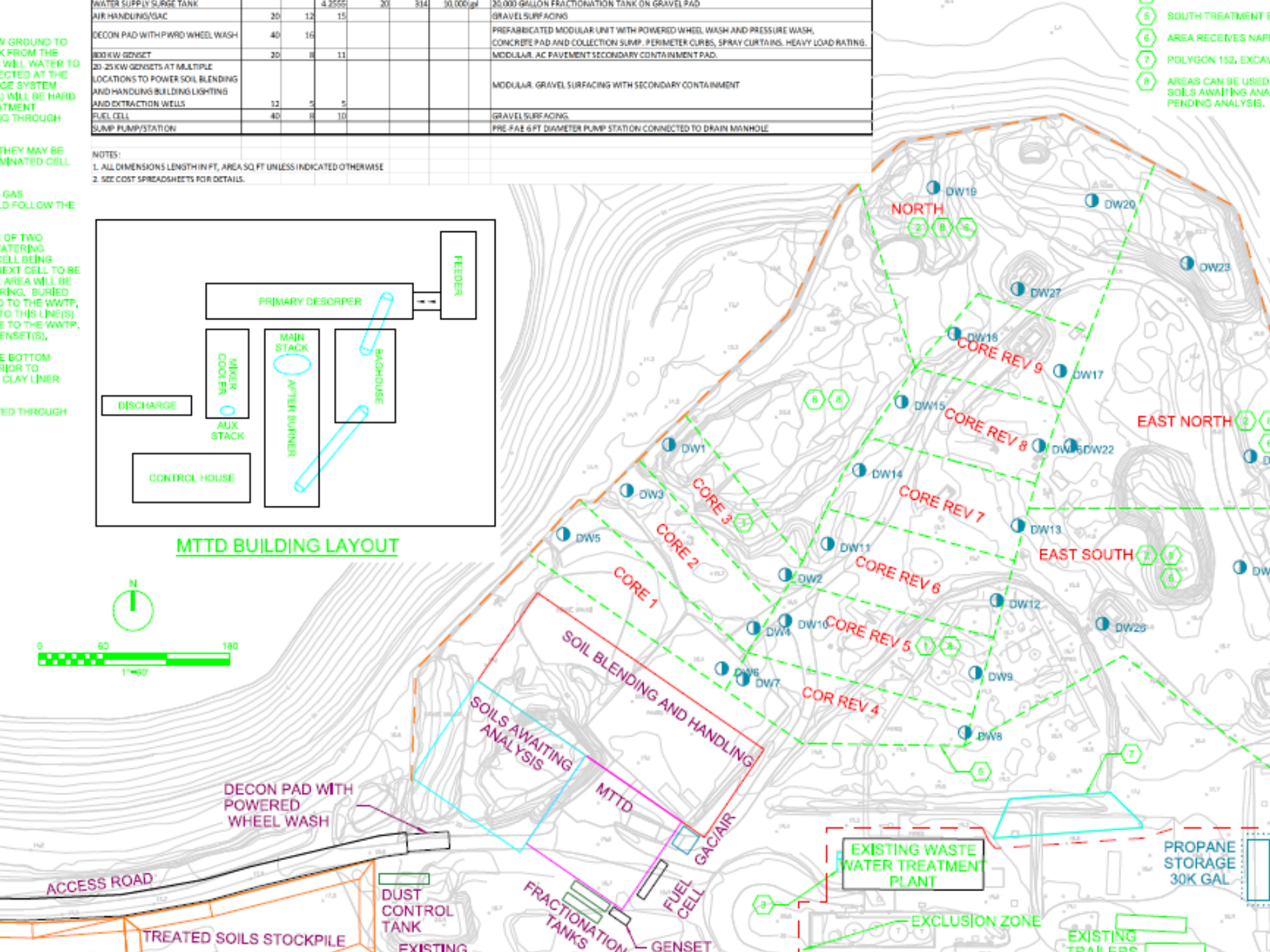
Medium Temperature Thermal Desorption

- "Ex-situ" = Creosote-contaminated soil is excavated prior to treatment.
- Excavated soil is treated on site in a boiler.
- Air emissions are controlled/treated as part of the process.
- Treated clean soil is placed back in the excavation.

WATER SUPPLY SURGE TANK			4.2555	20	314	10,000 gal	20,000 GALLON FRACTIONATION TANK ON GRAVEL PAD
AIR HANDLING/GAC	20	12	15				GRAVEL SURFACING
DECON PAD WITH PWRD WHEEL WASH	40	16					PREFABRICATED MODULAR UNIT WITH POWERED WHEEL WASH AND PRESSURE WASH, CONCRETE PAD AND COLLECTION SUMP. PERIMETER CURBS, SPRAY CURTAINS. HEAVY LOAD RATING.
800 KW GENSET	20	8	11				MODULAR. AC PAVEMENT SECONDARY CONTAINMENT PAD.
20 .25 KW GENSETS AT MULTIPLE LOCATIONS TO POWER SOIL BLENDING AND HANDLING BUILDING LIGHTING AND EXTRACTION WELLS	12	5	5				MODULAR. GRAVEL SURFACING WITH SECONDARY CONTAINMENT
FUEL CELL	40	8	10				GRAVEL SURFACING.
SUMP PUMP/STATION							PRE-FAB 6 FT DIAMETER PUMP STATION CONNECTED TO DRAIN MANHOLE

NOTES:
1. ALL DIMENSIONS LENGTH IN FT, AREA SQ FT UNLESS INDICATED OTHERWISE
2. SEE COST SPREADSHEETS FOR DETAILS.

MTTD BUILDING LAYOUT



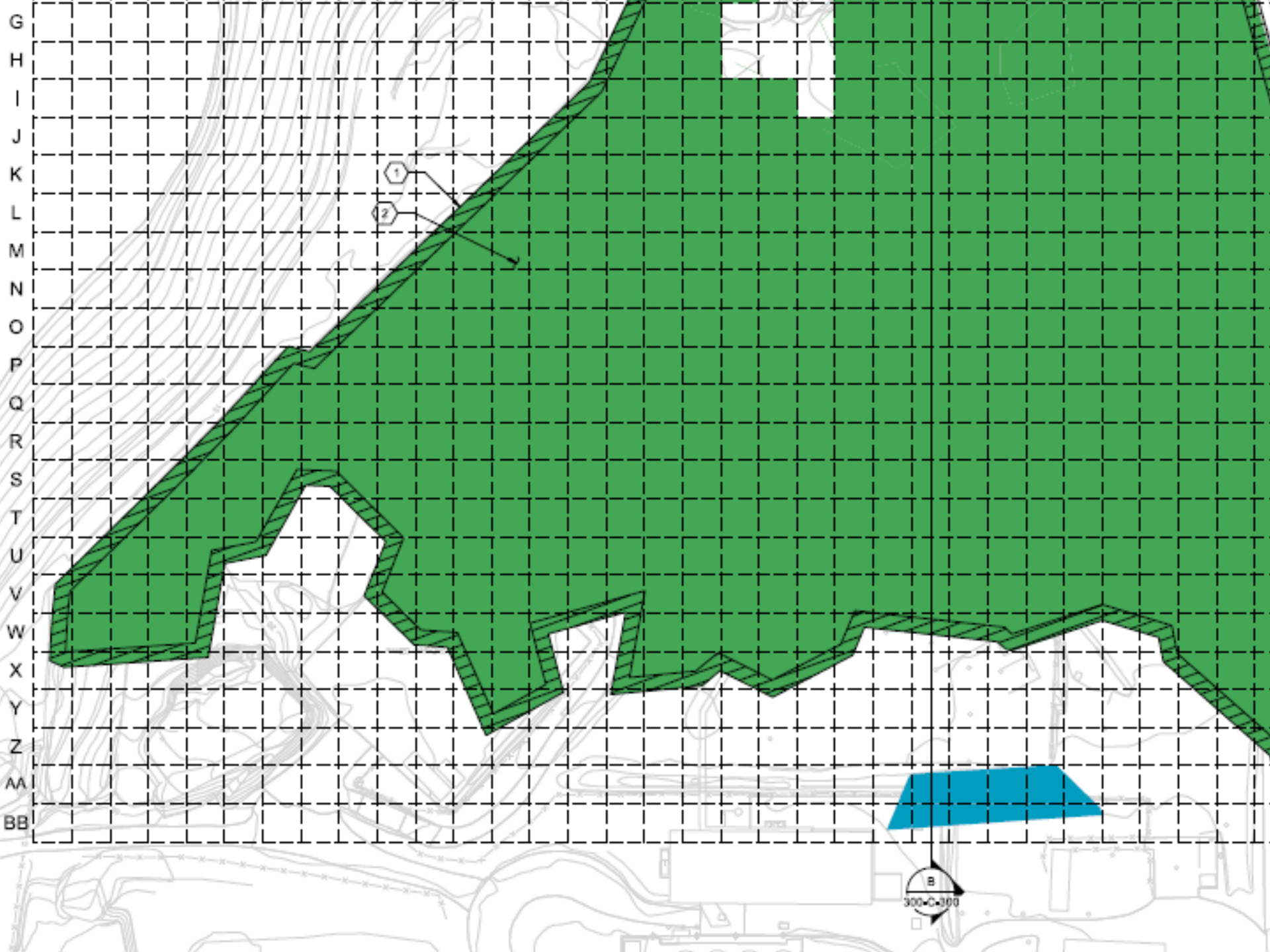
In Situ Stabilization

- Inject Portland Cement mixture below ground to form a concrete column to immobilize the creosote product
- Use Jet Grouting for deeper contaminated areas
- Post-Initial Source Reduction (if needed) – The site will be treated by air injection, O_2 injection, or *In Situ* Chemical Oxidation

ISS Equipment

8’ Auger

Layout for 5’ ISS Columns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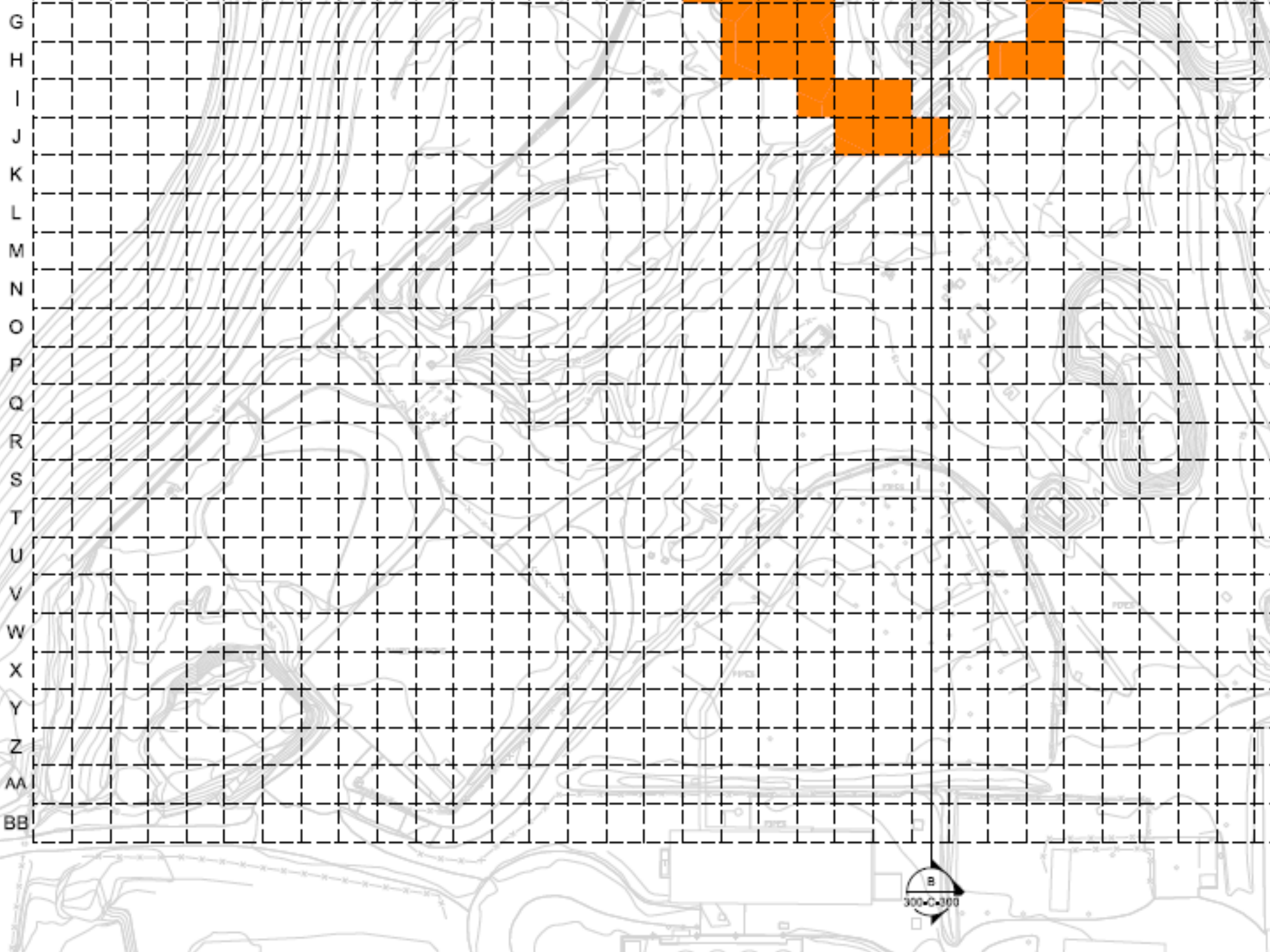
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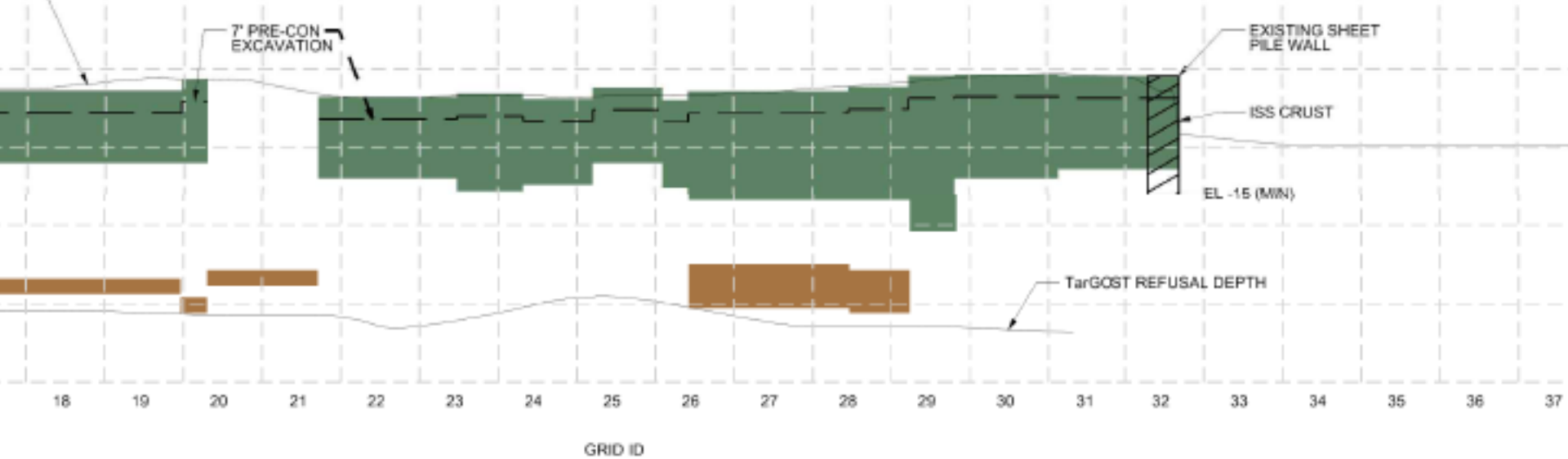

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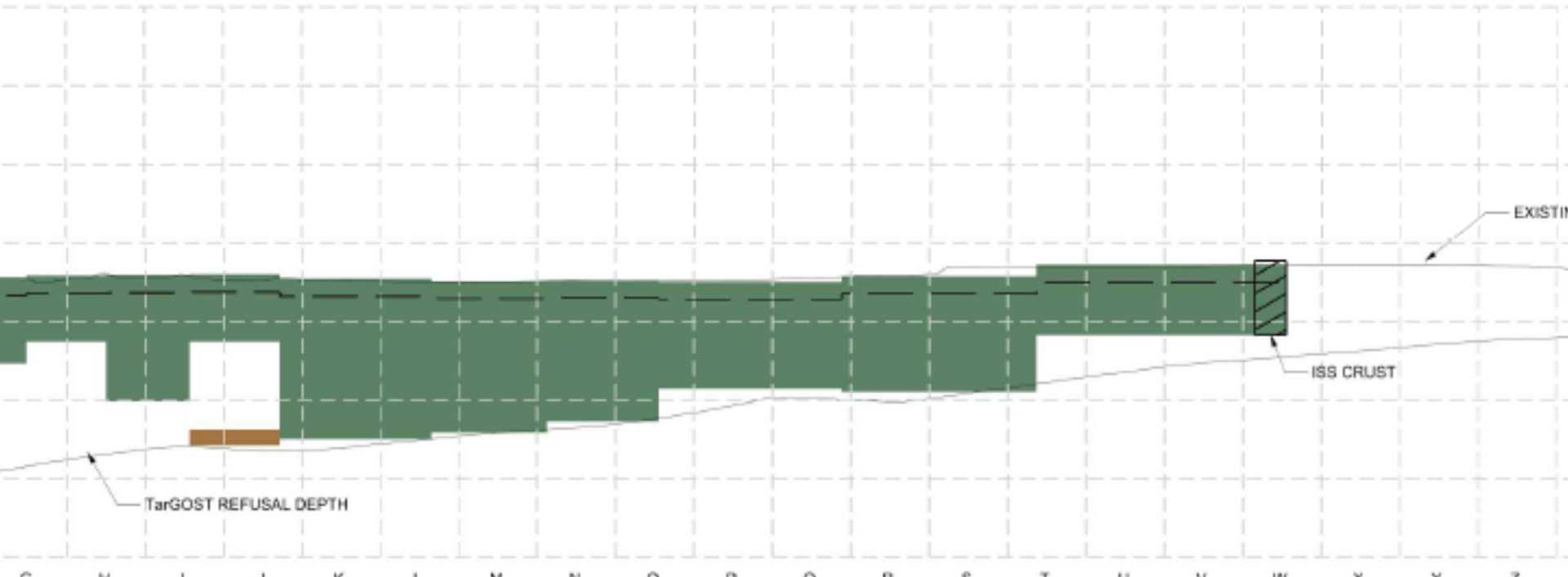
300-C-102

WEST / EAST SITE SECTION

SCALE: 1"=30'



Remedial Action Objectives

- These are the objectives that the final cleanup remedy will meet once it's completed.
- 1. Prevent risk to human health and the environment from direct contact with contaminated surface soils.
  - This objective will be met when contaminated soil has either been removed or capped.
- 2. Prevent further degradation in lower aquifer groundwater and restore that portion of the aquifer beyond the influence of saltwater intrusion to MCLs within a reasonable timeframe.
- 3. That portion of the lower aquifer that is influenced by saltwater intrusion shall be protective of discharge to surface waters in Eagle Harbor and Puget Sound.

Next steps for both Upland and Beaches

- Draft Focused Feasibility Studies June 2014
- EPA Remedy Review Board July 2014
- Proposed Plan available for public review and comment Fall 2014
  - Notice in newspaper
  - Formal public meeting(s)
  - Opportunity for verbal and written comment
- Record of Decision Summer 2015

Resources for finding out more about technologies

- http://www.clu-in.org/remediation/
  (Cleanup Information – EPA)
- http://www.itrcweb.org/Guidance
  (Interstate Technology & Regulatory Council)